

IN THE CLAIMS:

Rewrite the pending claims and add new claims as follows:

1. (Currently Amended) A method of forming a visual plot ~~using~~ from a dataset having a hierarchical structure ~~of a dataset~~, wherein said dataset comprises a measure attribute and a hierarchical dimension attribute, the dimension attribute ~~consisting of~~ comprising a plurality of levels, ~~the plurality of levels forming a dimension hierarchy~~, the method comprising:
  - (A) constructing said visual plot based on a specification, ~~wherein a first level from said plurality of levels is represented by a first component of said visual plot and wherein a second level from said plurality of levels is represented by a second component of said visual plot~~;
  - (B) querying said dataset to retrieve data in accordance with said specification, said data ~~including all or~~ corresponding to at least a portion of said dimension attribute and ~~all or~~ at least a portion of said measure attribute; and
  - (C) populating said visual plot with said retrieved data in accordance with said specification by associating a first level from said plurality of levels with a first axis of said visual plot and a second level from said plurality of levels with a second axis of said visual plot, wherein said first axis and said second axis have different orientations  
~~when said first component and said second component are each not an axis or a single layer of said visual plot, said first component is on a different layer or axis of said visual plot than said second component.~~
2. (Original) The method of claim 1 wherein said dataset is a database.
3. (Original) The method of claim 2 wherein said querying said dataset to retrieve data in accordance with said specification comprises querying the database to retrieve a set of tuples in accordance with said specification.
4. (Currently Amended) The method of claim 3 wherein said visual plot comprises a plurality of panes and said populating said visual plot with said retrieved data in accordance with said specification comprises associating ~~all or~~ at least a subset of said set of tuples with a pane in said plurality of panes.
5. (Currently Amended) The method of claim 4 ~~the method~~ further comprising encoding a tuple in said subset of tuples in said pane as a graphic.

6. (Original) The method of claim 1 wherein said specification is in a language based on the hierarchical structure of the dataset.

7. (Canceled)

8. (Currently Amended) The method of claim ~~[[7]]~~ 1 wherein said first ~~component is said plurality of level corresponds to one or more rows of said visual plot~~ and said second ~~component is said plurality of level corresponds to one or more columns of said visual plot.~~

9. (Original) The method of claim 8 wherein each row in said plurality of rows or each column in said plurality of column is assigned a different color or hash pattern.

10.-14. (Canceled)

15. (Currently Amended) The method of claim ~~[[14]]~~ 1 wherein said ~~[[set]]~~ plurality of levels represent the levels month, quarter, and year ~~and said set of levels consist of the levels month and year.~~

16. (Currently Amended) The method of claim 1 wherein  
a ~~set of~~ multiple levels from said dimension attribute including said first level are represented by said first ~~component~~ axis; and  
said ~~set of~~ multiple levels are represented ~~[[in]]~~ on said first ~~component~~ axis of said visual plot in an order that deviates from an order in said hierarchical dimension attribute hierarchy.

17. (Original) The method of claim 1 wherein said retrieved data is represented in text form, as a bar chart, or as a scatterplot in said visual plot.

18. (Original) The method of claim 1 wherein said specification comprises an algebraic expression that includes an operand, wherein said algebraic expression represents an operation on said hierarchical structure of said dataset.

19. (Currently Amended) The method of claim 1 wherein  
said specification organizes said visual plot into a plurality of rows and a plurality of columns; and

said specification comprises a first algebraic expression for said plurality of rows and a second algebraic expression for said plurality of columns, ~~and~~ wherein at least one of said

first algebraic expression and said second algebraic expression represents an operation on said hierarchical structure of said dataset.

20. (Currently Amended) The method of claim 19 wherein said specification further organizes said ~~plurality of panes~~ visual plot into a plurality of layers;

said specification further comprises a third algebraic expression for said plurality of layers; and

said third algebraic expression represents an operation on said hierarchical structure of said dataset.

21. (Canceled)

22. (Currently Amended) The method of claim ~~[[21]]~~ 1 wherein

said first ~~component~~ axis represents ~~[[a]]~~ said first level of said hierarchical dimension attribute hierarchy and ~~[[a]]~~ said measure attribute such that said measure attribute is partitioned into a plurality of segments, each segment in said plurality of segments representing a data point in said first level; ~~and~~

~~said second component represents at least a second level of said dimension hierarchy.~~

23. (Currently Amended) The method of claim ~~[[21]]~~ 22 wherein said dimension attribute is time.

24. (Currently Amended) The method of claim ~~[[21]]~~ 22 wherein each data point in said first level represents a predetermined time period.

25. (Original) The method of claim 24 wherein said predetermined time period is one of a year, a quarter, a month, a week, a day, an hour, a minute, or a second.

26. (Currently Amended) The method of claim ~~[[21]]~~ 22 wherein each segment in said plurality of segments is assigned a different color or a different hash pattern.

27. (Currently Amended) The method of claim 1 wherein

said first ~~component~~ axis represents a level of detail of a graphic,

~~said second component is represented on a first axis,~~ and

said second axis represents ~~[[a]]~~ said measure attribute.

28. (Currently Amended) The method of claim 27 wherein said graphic is partitioned into a plurality of segments in accordance with said level of detail such that each segment of said plurality of segments is assigned a different color or a different hash pattern and each segment of said plurality of segments represents a different data point in the second level of said hierarchical dimension attribute hierarchy.

29. (Original) The method of claim 28 wherein said first level is year and said second component is month.

30. (Currently Amended) A computer program product for use in conjunction with a computer system, the computer program product comprising a computer readable storage medium and a computer program mechanism embedded therein, ~~the computer program mechanism~~ for forming a visual plot using from a dataset having a hierarchical structure of a dataset, wherein said dataset comprises a measure attribute and a hierarchical dimension attribute, the dimension attribute consisting of comprising a plurality of levels, ~~the plurality of levels forming a dimension hierarchy~~, the computer program mechanism comprising instructions that, if executed by the computer system, cause the computer system to:

(A) ~~instructions for constructing~~ construct said visual plot based on a specification, ~~wherein a first level from said plurality of levels is represented by a first component of said visual plot and wherein a second level from said plurality of levels is represented by a second component of said visual plot;~~

(B) ~~instructions for querying~~ query said dataset to retrieve data in accordance with said specification, said data ~~including all or~~ corresponding to at least a portion of said dimension attribute and ~~all or at least~~ a portion of said measure attribute; and

(C) ~~instructions for populating~~ populate said visual plot with said retrieved data in accordance with said specification by associating a first level from said plurality of levels with a first axis of said visual plot and a second level from said plurality of levels with a second axis of said visual plot, wherein said first axis and said second axis have different orientations

~~when said first component and said second component are each not an axis or a single layer of said visual plot, said first component is on a different layer or axis of said visual plot than said second component.~~

31. (Original) The computer program product of claim 30 wherein said dataset is a database.

32. (Original) The computer program product of claim 31 wherein said querying said dataset to retrieve data in accordance with said specification comprises querying the database to retrieve a set of tuples in accordance with said specification.

33. (Currently Amended) The computer program product of claim 32 wherein said visual plot comprises a plurality of panes and said populating said visual plot with said retrieved data in accordance with said specification comprises associating ~~all or~~ at least a subset of said set of tuples with a pane in said plurality of panes.

34. (Currently Amended) The computer program product of claim 33 ~~the computer program mechanism~~ further comprising instructions for encoding a tuple in said subset of tuples in said pane as a graphic.

35. (Currently Amended) The computer program product of claim 30 wherein said ~~instructions for constructing comprise instructions for providing a~~ specification ~~that~~ is in a language based on the hierarchical structure of the dataset.

36. (Canceled)

37. (Currently Amended) The computer program product of claim ~~[[36]]~~ 30 wherein said first ~~component is said plurality of~~ level corresponds to one or more rows of said visual plot and said second ~~component is said plurality of~~ level corresponds to one or more columns of said visual plot.

38. (Original) The computer program product of claim 37 wherein each row in said plurality of rows or each column in said plurality of column is assigned a different color or hash pattern.

39.-43. (Canceled)

44. (Currently Amended) The computer program product of claim ~~[[43]]~~ 30 wherein said ~~[[set]]~~ plurality of levels represent the levels month, quarter, and year ~~and said set of levels consist of the levels month and year~~.

45. (Currently Amended) The computer program product of claim 30 wherein ~~a set of~~ multiple levels from said dimension attribute including said first level are represented by said first ~~component~~ axis; and

said ~~set of~~ multiple levels are represented ~~[[in]] on~~ said first ~~component~~ axis of said visual plot in an order that deviates from an order in said hierarchical dimension attribute hierarchy.

46. (Original) The computer program product of claim 30 wherein said retrieved data is represented in text form, as a bar chart, or as a scatterplot in said visual plot.

47. (Original) The computer program product of claim 30 wherein said specification comprises an algebraic expression that includes an operand, wherein said algebraic expression represents an operation on said hierarchical structure of said dataset.

48. (Currently Amended) The computer program product of claim 30 wherein said specification organizes said visual plot into a plurality of rows and a plurality of columns; and

said specification comprises a first algebraic expression for said plurality of rows and a second algebraic expression for said plurality of columns, ~~and~~ wherein at least one of said first algebraic expression and said second algebraic expression represents an operation on said hierarchical structure of said dataset.

49. (Currently Amended) The computer program product of claim 48 wherein said specification further organizes said ~~plurality of panes~~ visual plot into a plurality of layers;

said specification further comprises a third algebraic expression for said plurality of layers; and

said third algebraic expression represents an operation on said hierarchical structure of said dataset.

50. (Canceled)

51. (Currently Amended) The computer program product of claim ~~[[50]]~~ 30 wherein said first ~~component~~ axis represents ~~[[a]]~~ said first level of said hierarchical dimension attribute hierarchy and ~~[[a]]~~ said measure attribute ~~such that said measure~~ is partitioned into a plurality of segments, each segment in said plurality of segments representing a data point in said first level; ~~and~~

~~said second component represents at least a second level of said dimension hierarchy.~~

52. (Currently Amended) The computer program product of claim ~~[[51]]~~ 50 wherein said dimension is time.
53. (Currently Amended) The computer program product of claim ~~[[51]]~~ 50 wherein each data point in said first level represents a predetermined time period.
54. (Original) The computer program product of claim 53 wherein said predetermined time period is one of a year, a quarter, a month, a week, a day, an hour, a minute, or a second.
55. (Currently Amended) The computer program product of claim ~~[[50]]~~ 51 wherein each segment in said plurality of segments is assigned a different color or a different hash pattern.
56. (Currently Amended) The computer program product of claim 30 wherein said first ~~component~~ axis represents a level of detail of a graphic, ~~said second component is represented on a first axis, and~~ said second axis represents ~~[[a]]~~ said measure attribute.
57. (Currently Amended) The computer program product of claim 56 wherein said graphic is partitioned into a plurality of segments in accordance with said level of detail such that each segment of said plurality of segments is assigned a different color or a different hash pattern and each segment of said plurality of segments represents a different data point in the second level of said hierarchical dimension attribute ~~hierarchy~~.
58. (Original) The computer program product of claim 57 wherein said first level is year and said second component is month.
59. (Currently Amended) A computer system for forming a visual plot ~~using from a~~ dataset having a hierarchical structure ~~of a dataset~~, wherein said dataset comprises a measure attribute and a hierarchical dimension attribute, the dimension attribute ~~consisting of~~ comprising a plurality of levels, ~~the plurality of levels forming a dimension hierarchy~~, the computer system comprising:
- a central processing unit;
  - a memory, coupled to the central processing unit, the memory storing:
  - said dataset; and
  - a programming module comprising:

(A) ~~instructions for constructing said visual plot based on a specification, wherein a first level from said plurality of levels is represented by a first component of said visual plot and wherein a second level from said plurality of levels is represented by a second component of said visual plot;~~

(B) instructions for querying said dataset to retrieve data in accordance with said specification, said data ~~including all or~~ corresponding to at least a portion of said dimension attribute and ~~all or~~ at least a portion of said measure attribute; and

(C) instructions for populating said visual plot with said retrieved data in accordance with said specification by associating a first level from said plurality of levels with a first axis of said visual plot and a second level from said plurality of levels with a second axis of said visual plot, wherein said first axis and said second axis have different orientations

~~when said first component and said second component are each not an axis or a single layer of said visual plot, said first component is on a different layer or axis of said visual plot than said second component.~~

60. (Original) The computer system of claim 59 wherein said dataset is a database.

61. (Original) The computer system of claim 60 wherein said querying said dataset to retrieve data in accordance with said specification comprises querying the database to retrieve a set of tuples in accordance with said specification.

62. (Currently Amended) The computer system of claim 61 wherein said visual plot comprises a plurality of panes and said populating said visual plot with said retrieved data in accordance with said specification comprises associating ~~all or~~ at least a subset of said set of tuples with a pane in said plurality of panes.

63. (Currently Amended) The computer system of claim 62 ~~the programming module~~ further comprising instructions for encoding a tuple in said subset of tuples in said pane as a graphic.

64. (Currently Amended) The computer system of claim 59 wherein said ~~constructing~~ ~~comprises providing a specification that~~ is in a language based on the hierarchical structure of the dataset.

65. (Canceled)



66. (Currently Amended) The computer system of claim ~~[[65]]~~ 59 wherein said first ~~component is said plurality of level corresponds to one or more rows of said visual plot and~~ said second ~~component is said plurality of level corresponds to one or more columns of said~~ visual plot.

67. (Original) The computer system of claim 66 wherein each row in said plurality of rows or each column in said plurality of column is assigned a different color or hash pattern.

68.-72. (Canceled)

73. (Currently Amended) The computer system of claim ~~[[72]]~~ 59 wherein said ~~[[set]]~~ plurality of levels represent the levels month, quarter, and year ~~and said set of levels consist of the levels month and year.~~

74. (Currently Amended) The computer system of claim 59 wherein  
a set of multiple levels from said dimension attribute including said first level are represented by said first ~~component~~ axis; and  
said set of multiple levels are represented ~~[[in]]~~ on said first ~~component~~ axis of said visual plot in an order that deviates from an order in said hierarchical dimension attribute hierarchy.

75. (Original) The computer system of claim 59 wherein said retrieved data is represented in text form, as a bar chart, or as a scatterplot in said visual plot.

76. (Original) The computer system of claim 59 wherein said specification comprises an algebraic expression that includes an operand, wherein said algebraic expression represents an operation on said hierarchical structure of said dataset.

77. (Currently Amended) The computer system of claim 59 wherein  
said specification organizes said visual plot into a plurality of rows and a plurality of columns; and  
said specification comprises a first algebraic expression for said plurality of rows and a second algebraic expression for said plurality of columns, ~~and~~ wherein at least one of said first algebraic expression and said second algebraic expression represents an operation on said hierarchical structure of said dataset.

78. (Currently Amended) The computer system of claim 77 wherein

said specification further organizes said ~~plurality of panes~~ visual plot into a plurality of layers;

said specification further comprises a third algebraic expression for said plurality of layers; and

said third algebraic expression represents an operation on said hierarchical structure of said dataset.

79. (Canceled)

80. (Currently Amended) The computer system of claim [[79]] 59 wherein said first ~~component~~ axis represents [[a]] said first level of said hierarchical dimension attribute hierarchy and [[a]] said measure attribute such that said measure attribute is partitioned into a plurality of segments, each segment in said plurality of segments representing a data point in said first level; ~~and~~  
~~said second component represents at least a second level of said dimension hierarchy.~~

81. (Currently Amended) The computer system of claim [[79]] 80 wherein said dimension attribute is time.

82. (Currently Amended) The computer system of claim [[79]] 80 wherein each data point in said first level represents a predetermined time period.

83. (Original) The computer system of claim 82 wherein said predetermined time period is one of a year, a quarter, a month, a week, a day, an hour, a minute, or a second.

84. (Currently Amended) The computer system of claim [[79]] 80 wherein each segment in said plurality of segments is assigned a different color or a different hash pattern.

85. (Currently Amended) The computer system of claim 59 wherein said first ~~component~~ axis represents a level of detail of a graphic, ~~said second component is represented on a first axis,~~ and said second axis represents [[a]] said measure attribute.

86. (Currently Amended) The computer system of claim 85 wherein said graphic is partitioned into a plurality of segments in accordance with said level of detail such that each segment of said plurality of segments is assigned a different color or a different hash pattern

and each segment of said plurality of segments represents a different data point in the second level of said hierarchical dimension attribute ~~hierarchy~~.

87. (Original) The computer system of claim 86 wherein said first level is year and said second component is month.

88. (Original) The method of claim 2 wherein said querying said dataset to retrieve data in accordance with said specification comprises querying the database to retrieve a set of objects in accordance with said specification.

89. (Original) The computer program product of claim 30 wherein said querying said dataset to retrieve data in accordance with said specification comprises querying the database to retrieve a set of objects in accordance with said specification.

90. (Original) The computer system of claim 59 wherein said querying said dataset to retrieve data in accordance with said specification comprises querying the database to retrieve a set of objects in accordance with said specification.